

Exercise 2.2

Declarative vs. Procedural Knowledge

Following are ten statements regarding academic content. For each one, determine whether it is declarative, procedural, or either. If either, explain why.

1. Creating a line graph to represent data	Declarative	Procedural	Either
2. Describing the events that led to the Cold War	Declarative	Procedural	Either
3. Determining breathing rate and heart rate	Declarative	Procedural	Either
4. Refusal skills	Declarative	Procedural	Either
5. Characteristics of chance events	Declarative	Procedural	Either
6. Keyboarding techniques	Declarative	Procedural	Either
7. Keeping in rhythm	Declarative	Procedural	Either
8. The relationship between the seasons and the tilt of the earth	Declarative	Procedural	Either
9. Survey sampling technique	Declarative	Procedural	Either
10. Front-end rounding	Declarative	Procedural	Either

Exercise 2.3

Translating General Statements Into Learning Goals

Following are phrases representing general aspects of information and skill in specific subject areas. Translate these phrases into clearer statements of learning goals. For example, if you are provided with the phrase "writing effective paragraphs," you might translate this into the goal statement: "Students will be able to write paragraphs that include clear transition statements from one paragraph to the next."

The idea behind this exercise is to write learning goals that provide more specific guidance for the student and the teacher.

- Language arts general statement: Speaking effectively
Goal statement:
 - Mathematics general statement: Reducing fractions
Goal statement:
 - Science general statement: Understanding photosynthesis
Goal statement:
 - Social studies general statement: Knowing local history
Goal statement:
 - Physical education general statement: Agility
Goal statement:
 - Technology general statement: Using Excel
Goal statement:
 - World languages general statement: Spanish conversation
Goal statement:
 - The arts general statement: Music appreciation
Goal statement:
 - Language arts general statement: Reading comprehension
Goal statement:
 - Mathematics general statement: Estimating
Goal statement:
- Now write a specific learning goal for your own subject area:

Exercise 2.4

Designing Assessment Tasks for Learning Goals

Following are ten learning goals in various subject areas. For each one, write a sample assessment task.

1. Students will be able to use knowledge of prefixes, suffixes, and roots to spell words.

2. Students will explain the rules and strategies of a team game.

3. Students will explain how an organism's behavior is related to the physical characteristics of its environment.

4. Students will illustrate how food works as an energy source.

5. Students will be able to create and separate a simple mixture such as salt and sand.

6. Students will be able to analyze a speaker's presentation with an eye for logical fallacy.

7. Students will describe the articles and amendments of the Constitution of the United States.

8. Students will be able to determine cause and effect of historical events in the exploration of the Americas.

9. Students will be able to generate a hypothesis or a prediction based on an observation.

10. Students will determine the main idea and supporting details of an expository text.

Answers to Exercise 2.2

Declarative vs. Procedural Knowledge

1. Creating a line graph to represent data

This statement is procedural. There is a certain amount of declarative information required (students must be familiar with data sets and line graphs), but the emphasis is on the creation of a line graph that accurately reflects a set of data. The teacher is asking the student to *do* something.

2. Describing the events that led to the Cold War

This statement is declarative. Students are required to demonstrate knowledge of the Cold War. Again, a certain amount of procedural knowledge is required in that students must describe what they know, but the emphasis is clearly on knowledge of the Cold War and not on speaking or describing.

3. Determining breathing rate and heart rate

Given the way this statement is worded, it could be either procedural or declarative. If the emphasis is on information about breathing and heart rate (what rates are common in resting, normal, and active states, for example), the statement would be declarative. In that case, it might be reworded into something like the following: *Students will understand the common breathing and heart rates for resting, normal, and active states for people their own age.* If the focus is on the process of finding these rates, the statement would be procedural. In that case, it might be reworded to reflect a statement like the following: *Students will be able to find and calculate the breathing and heart rates for themselves and others.*

4. Refusal skills

This statement could be either declarative or procedural. If the focus is only on having an understanding of refusal skills and the situations in which they might be useful, the focus is on declarative information, and the statement can be reworded to read as follows: *Students will understand proper refusal skills and the academic and social situations in which they would be used.* If the teacher wants the students to put this knowledge to use, the focus would be primarily procedural. It could be reworded like this: *Students will be able to demonstrate proper refusal skills in appropriate academic and social situations.*

5. Characteristics of chance events

This statement is declarative. Students are required to understand the defining characteristics of a concept—chance events.

6. Keyboarding techniques

This statement could be either declarative or procedural. If the emphasis is on

the physical process of keyboarding, it would be procedural knowledge; if the emphasis is on understanding the position of the keys, it would be declarative knowledge.

7. Keeping in rhythm

This statement is primarily procedural. It could be argued that if the emphasis is on understanding how to keep rhythm then it could be declarative as well, but most often people do not understand rhythm in an informational way. We understand rhythm by the process of keeping it.

8. The relationship between the seasons and the tilt of the earth

This statement is declarative. It requires an understanding of causal relationships.

9. Survey sampling technique

This statement could be either declarative or procedural. It is most likely that the intended focus is on the use of survey sampling techniques for a given purpose, and in that case, the statement would be procedural and could read something like: *Students will be able to use appropriate survey sampling techniques and report results.*

10. Front-end rounding

This statement could be either declarative or procedural. It is likely that the teacher would want students not only to have declarative knowledge of front-end rounding (how it is done and what its purpose is), but to be able to perform the process as well. If the teacher's aim is the former, the statement might read as follows: *Students will understand the purpose and steps in front-end rounding.* If the teacher's aim is the latter, the statement will read like this: *Students will be able to use front-end rounding.*

Translating General Statements Into Learning Goals

1. *Language arts general statement: Speaking effectively*

Goal statement: Students will be able to present a five- to seven-minute oral argument on the topic of their choosing. The argument will have a clear introduction, main premise, supporting statements, and conclusion. Students will verbally acknowledge correct grammar throughout.

2. *Mathematics general statement: Reducing fractions*

Goal statement: Students will be able to recognize complex fractions that can be reduced to simpler terms and will be able to perform the arithmetic necessary to correctly complete the reduction.

3. *Science general statement: Understanding photosynthesis*

Goal statement: Students will be able to describe how photosynthesis functions in terms of plant respiration, nutrition, and growth, and will be able to identify factors that support or inhibit photosynthesis.

4. *Social studies general statement: Knowing local history*

Goal statement: Students will be able to list five important events in local history and explain why each of them is significant.

5. *Physical education general statement: Agility*

Goal statement: Students will be able to catch a ball thrown to their left or right sides.

6. *Technology general statement: Using Excel*

Goal statement: Students will be able to enter data into an Excel spreadsheet, apply variable and value labels to the data, and perform simple descriptive data analysis such as calculating means, standard deviations, and percentages.

7. *World languages general statement: Spanish conversation*

Goal statement: Students will be able to converse with one another in Spanish about the type of food they like for breakfast.

8. *The arts general statement: Music appreciation*

Goal statement: Students will be able to identify their favorite type of music and explain in specific terms why that type is their favorite.

9. *Language arts general statement: Reading comprehension*

Goal statement: Students will be able to discuss explicitly and implicitly stated themes and ideas.

10. *Mathematics general statement: Estimating*

Goal statement: Students will be able to estimate sums and differences mentally.

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Answers to Exercise 2.4

Designing Assessment Tasks for Learning Goals

1. *Students will be able to use knowledge of prefixes, suffixes, and roots to spell words.*

Sample assessment: Use the provided lists of prefixes, suffixes, and roots to assemble a word.

2. *Students will explain the rules and strategies of a team game.*

Sample assessment: We have been studying the sport of basketball. Following is a set of statements about the rules of the game. Identify each statement as either true or false. The last question outlines a specific scenario common to the sport. Outline the strategy you would use in that situation to win the game.

3. *Students will explain how an organism's behavior is related to the physical characteristics of its environment.*

Sample assessment: We have been studying the Arctic and Antarctic climates and the animals that live there. Provide a brief description of the climate, and then choose your favorite of the animals we have studied. How does this animal get its food, and how is this related to the environment in which it lives?

4. *Students will illustrate how food works as an energy source.*

Sample assessment: Using the diagram of the human body provided, create a flowchart illustrating how food is digested and used as energy.

5. *Students will be able to create and separate a simple mixture such as salt and sand.*

Sample assessment: Use the container provided to mix two of the substances in front of you. Keep in mind when making your mixture that you will also have to separate the substances back into pure form.

6. *Students will be able to analyze a speaker's presentation with an eye for logical fallacy.*

Sample assessment: We will be giving class presentations in the next few days. When another student is speaking, take notes on his or her main points in the order of presentation. When the speech is finished, you will have a few moments to look over your notes and write a brief review of the speech. Please include your thoughts on the logic of the argument presented and why it did or did not convince you.

7. *Students will describe the articles and amendments of the Constitution of the United States.*

Sample assessment: We have been studying the articles and amendments of the Constitution of the United States. Choose an article or amendment you consider to be important in today's society and write a brief description of what you think would change if that article or amendment had never been drafted.

8. *Students will be able to determine cause and effect of historical events in the exploration of the Americas.*

Sample assessment: We have been studying the discovery and exploration of the Americas. Provide a brief description of the lives and cultures of people native to the United States and what happened to these people as a result of the age of European exploration. Name two specific events, and explain why they exemplify the cause-and-effect relationship of the Native Americans to the European explorers and pilgrims.

9. *Students will be able to generate a hypothesis or a prediction based on an observation.*

Sample assessment: Today we will watch four chemical reactions involving three chemicals. Write down what you see as we go along. At the end of class, I will give you the names of two chemicals. Think about these chemicals and how they are different from and similar to the chemicals we saw in reactions during class. Make a prediction about how these two chemicals will react, and explain your reasoning.

10. *Students will determine the main idea and supporting details of an expository text.*

Sample assessment: Read the following excerpt. Write a few sentences describing what the main idea is, and name at least two supporting details you found in the text.